

**REMARKS**

The learned examiner is thanked for the office action. However, the rejection of the claims under 35 USC § 103 is respectfully traversed. The learned examiner asserts that *Chalkley* discloses that vessels used for actinometric measurements may be of a variety of shapes however, *Chalkley* in each instance in which a thickness was defined stated that the absorbence measurement was performed in a 1 cm cell. See *Chalkley* column 1 line 63 to 65; column 4 lines 66 to 68; column 6, lines 17 to 20. Further *Chalkley* never stated that any of the cells were spherical and never indicated that any of the measurements were omni-directional. Thus, *Chalkley* does not suggest or teach that the measurement of fluence may be carried out in a spherical actinometer independently of the dimensions of the actinometer as claimed.

The examiner combines *Chalkley* with *Brown* to postulate that other shapes such as a spherical ampoule would be obvious to researchers. However, *Brown's* metallic vapor generating ampoule is not intended for the measurement of fluence and is in fact not transmissive to UV or the radiation of the type discussed in the claims or specification of the instant application. Rather, *Brown's* ampoule is a vapor generator that is preferentially cylindrical rather than spherical, and happens to be opaque or metallic because of the volatile contents of the sphere which are being turned to vapor and vented from the ampoule (vaporization vessel) in an industrial process. A buoy having a magnetic portion is disposed in the ampoule to assist in determining the level of the contents of the vaporization vessel during the process. *Brown* does not even give a geometry for a buoy to be used in a spherical ampoule that would maintain close association with an inner wall and move up and down with the level of the fluid, hence the one

line reference to spherical shapes in Brown is gratuitous overreaching by the drafter of the application and does not show that artisans consider geometric shapes of ampoules to be interchangeable. Nothing in *Brown* teaches or suggests that a spherical ampoule could be used to provide a non-dimensional dependant actinometer when filled with an actinometric fluid. Nothing in the combination of *Chalkley* and *Brown* teach or suggest that a spherical ampoule could be used to provide a non-dimensional dependant actinometer when filled with an actinometric fluid.

The Rahn publication upon which the learned examiner relies, was the rudimentary study by Rahm on the use of the iodide/iodate actinometric fluid, an investigation which continues. From that further research led to the realization that  $4\pi$  measurement of the germicidal effects of multisource UV radiation in medical and treatment venues might be possible. This research was published in Photochemistry and Photobiology, Vol. 70, Issue 3, Pages 314 and following in September 1999. The September 1999 publication was the first known combination of the elements of the invention disclosed in the present application. As noted therein and in the background of the instant application, prior attempts at using spherical actinometry had not lead to acceptance of spherical vessels for in situ measurement of UV fluence. Specifically "This problem of measuring radiation in a spherical or nonlabertian manner has been addressed previously by Middleton (18) who designed a spherical integrator or illuminometer for operation in the visible portion of the spectrum. More recently, Cabaj and Sommer (19) described the use of a spherical quartz vessel containing *Bacillus subtilis* spores to measure either UVC or solar radiation. The vessel used was much larger than that described here and was not satisfactory for measuring UVC unless the suspension of spores was well mixed during irradiation." Further,

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there had been no recognition that the spherical irradiation measurement vessel could be used as the absorbance measurement vessel without calibration for size.

Accordingly, Rahn's 1997 article does not teach or suggest the claimed invention, thus neither the primary or secondary references when combined yield the claimed invention. A declaration by Dr. Rahn in support of the forgoing argument is also submitted herewith. As noted by Dr. Rahn, the geometry of the containment vessel used for omni-directional irradiation and measurement is not suggested in the prior art.

Accordingly, the learned examiner is respectfully requested to withdraw the rejection and to issue the case. A Petition for a two month extension of time is respectfully submitted herewith.

Respectfully submitted,



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